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ILLUSTRATIONS OF FUNGI—XVII

WILLIAM A. MURRILL

The species here figured are mostly rare in the vicinity of New York and of little importance to the mycophagist.

Venenarius rubens (Scop.) Murrill

Amanita rubescens Pers.

BLUSHING VENENARIUS

Plate 113. Figure 1. × 1

Pileus ovoid to convex, at length expanded, 6–12 cm. broad, surface adorned with numerous thin, floccose or farinose warts, variable in color, always tinged with reddish or brownish-red, changing slowly to reddish when bruised, margin smooth or faintly striate; context white, changing slowly to reddish when bruised, with a pleasant odor and taste; lamellae free or slightly adnexed, crowded, nearly plane, white, characteristically chalky-white when dry; spores ellipsoid, smooth, hyaline, 10–11 × 6–7 μ; stipe equal or slightly tapering upward, usually bulbous, squamulose, whitish suffused with red, becoming reddish when bruised, stuffed, 6–20 cm. long, 6–12 mm. thick; annulus superior, ample, white, easily torn; volva very fragile, most of the fragments appearing on the surface of the pileus, while a few remain clinging to the margin of the bulb.

Found commonly in woods and groves from Maine to Alabama and west to Ohio. It contains poisons when raw, but these are disorganized by cooking or digestion. Although edible, I cannot advise any one to eat it, since many of its near relatives are so

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deadly. It might easily be confused with *Venenarius muscarius*, for example.

Hydrocybe caespitosa sp. nov.

CLUSTERED HYDROCYBE

Plate 113. Figure 2. × 1

Pileus convex to obconic, depressed at the center, loosely or densely clustered, about 2–2.5 cm. broad and 1.5 cm. thick; surface dry, melleous, ornamented with brown, innate, pointed scales, which are denser on the disk; context flavous, mild; lamellae broad, ventricose, distant, sinuate-decurrent, stramineous to cremeous; spores ellipsoid, pointed at one end, smooth, hyaline granular, 7.5–8.5 × 4–5 μ; stipe equal or enlarged above, glabrous, shining, citrinous, spongy within, 4–5 cm. long, 3–5 mm. thick.

Type collected among moss in an open pasture east of Bronx Park, New York City, September 26, 1909, by W. A. Murrill. Also collected in the same field October 8, 1911, by W. A. Murrill and E. C. Volkert. Specimens have been sent me very recently by Professor Coker from Chapel Hill, North Carolina, collected by W. B. Cobb. According to Saccardo's nomenclature, this species would be called **Hygrophorus caespitosus.**

Hydrocybe pratensis (Pers.)

Hygrophorus pratensis (Pers.) Fries

MEADOW HYDROCYBE

Plate 113. Figure 3. × 1

Pileus conic to convex, at length expanded, usually umbonate, 3–6 cm. broad; surface dry, smooth, glabrous, pale-testaceous, testaceous on the umbo, very slightly striate on the margin; context subconcolorous, mild; lamellae adnate to long-decurrent, subdistant, interveined, rather narrow and arcuate, ochroleucous with a pale-rosy tint; spores ellipsoid, smooth, hyaline, about 7 × 5 μ; stipe equal or slightly enlarged above, glabrous, white at the apex, white or slightly ochraceous below, hollow, reaching 5 cm. long and 1 cm. thick.

The above description was drawn from specimens collected in woods near Bronx Park, October, 1911. The species is widely distributed in woods and pastures and has many forms, one of which was figured in MYCOLOGIA for July, 1910.

Melanoleuca sordida (Schum.) Murrill

Tricholoma sordidum (Schum.) Fries

SORDID MELANOLEUCA

Plate 113. Figure 4. × 1

Pileus thin, convex to plane or slightly depressed, subumbonate at times, often irregular, gregarious or cespitose, 3–7 cm. broad; surface smooth, glabrous, pale-violet to avellaneous with ochraceous hues, usually fuliginous on the disk, margin naked, involute when young; context violaceous to whitish, mild, edible; lamellae sinuate to slightly decurrent, narrow, crowded, concolorous when young, fading with age; spores ellipsoid, smooth, pale-rosy-ochraceous in mass, 7–8 × 4–5 μ; stipe eccentric at times, equal, firm, concolorous, glabrous, stuffed or hollow, 3–8 cm. long, 4–8 mm. thick.

This species is rarely reported, but apparently is widely distributed though not abundant, occurring about manure piles and in cultivated ground where considerable manure is used. I have found it at two different places in the Garden and in great abundance under weeds on an old pile of cow manure just east of the Garden. It is much like *Melanoleuca personata*, with similar violet tints and spores colored exactly alike, but the cap is thinner and differently colored, the gills duller and browner, and the stem much slenderer and never bulbous. It also differs in its habitat and more or less clustered habit. American plants called *Tricholoma nudum* by some mycologists are doubtless referable to this species. *T. nudum* seems to be confused with *T. personatum* in some parts of Europe. René Maire has recently erected a new genus *Rhodoparillus*, for species of *Tricholoma* having pale-rosy-ochraceous spores.

Hypholoma aggregatum Peck

CLUSTERED HYPHOLOMA

Plate 113. Figure 5. × 1

Pileus thin, convex, densely cespitose, reaching 5 cm. broad; surface dry, white or grayish, ornamented with a few appressed, pale-umbrinous or avellaneous, fibrillose scales; context soft, watery, thin, odorless, mild; lamellae adnate or sinuate, rather crowded, whitish at first, at length dark-brown with a whitish edge; spores ellipsoid, smooth, brown, $7 \times 4\,\mu$; stipe long, equal, fibrillose, striate at the apex, hollow, reaching 6 cm. long and 1 cm. thick.

This is a rare species, found in rich soil in woods, and described from Alcove, New York, in 1893. It has been collected in the Garden once, and again in woods east of Bronx Park. *H. silvestre* is closely related.

Claudopus nidulans (Pers.) Peck

NEST-MAKING CLAUDOPUS

Plate 113. Figure 6. × 1

Pileus sessile or narrowed to a very short stipe, reniform to circular, usually imbricate, reaching 5 cm. or more broad; surface dry, tomentose or somewhat hirsute, bright-yellow, margin involute; context slightly tough; spores smooth, pink in mass, 6–7 μ long.

This beautiful species is widely distributed, occurring on dead logs in woods during autumn. It is the most important representative of the small genus *Claudopus,* which differs from *Pleurotus* in having rosy instead of white spores. The plants figured are small ones.

NEW YORK BOTANICAL GARDEN.

A PRELIMINARY STUDY OF THE GENUS LAMPROSPORA

FRED J. SEAVER

(WITH PLATE 114, CONTAINING 13 FIGURES)

In a previous paper,[1] the writer has called attention to some of the difficulties in the study of the present genus and in the same paper described two new species. The accumulation of additional data regarding the various species of the genus together with the collection of several apparently undescribed species has led the writer to make a preliminary study of the genus in North America. One of the most conspicuous features of many of the plants of the genus is their small size, many of them being one millimeter or less in diameter. For this reason many of the species have apparently been overlooked and even the best known are not often collected. While the ground has been covered as thoroughly as possible at the present time, it is not likely that the following list contains nearly all of the species occurring in North America.

About half of the species of the genus have sculptured spores and the nature of the sculpturing in such species furnishes one of the most valuable diagnostic characters. In many of the old descriptions the spores were simply described as rough or smooth with no definite information as to the exact nature of these roughenings. In the present paper especial attention has been given to a study of these spore characters. In most cases these studies have been based on fresh material collected by the writer. In a few cases we have been compelled to rely on dried specimens. An attempt has been made to bring out these characters in the accompanying plate.

The genus as treated here is used in rather a broader sense than the genus *Barlaea* of Saccardo, being made to include the genus *Detonia,* which, so far as I am able to judge, differs only in

[1] MYCOLOGIA 4: 45–48. 1912.

the larger size of the plants. The chief object of the present paper is to call attention to the number and variety of the species of the genus with the hope that these plants may receive more attention from collectors than they have formerly.

LAMPROSPORA De-Not. Comm. Critt. Ital. **1**: 388. 1864

Crouania Fuckel, Symb. Myc. 320. 1869. Not *Crouania* Agardh. 1842.

Plicaria Fuckel, Symb. Myc. 325. 1869.

Barlaea Sacc. Syll. Fung. **8**: 111. 1889. Not *Barlaea* Reich. 1877.

Detonia Sacc. Syll. Fung. **8**: 105. 1889.

Plicariella (Sacc.) Lindau in E. & P. Nat. Pfl. **1**[1]: 179. 1897.

Barlaeina Sacc. Syll. Fung. **14**: 30. 1899.

Pulvinula Boud. Hist. Class. Discom. 69. 1907.

Plants small or medium sized (.5 mm. to 3 cm. in diameter), concave, plane or slightly convex, sessile, usually bright colored, some shade of red, orange or yellow, more rarely pallid or dark colored, purple or brownish-black, externally smooth or verrucose but never clothed with well-developed hairs, substance fleshy, hymenium often roughened with the protruding asci; asci 8-spored, operculate; spores comparatively large, at first globose or subglobose, and smooth, at maturity often sculptured (spinulose, verrucose, reticulate, tuberculate or annulate), or remaining permanently smooth, hyaline or more rarely faintly colored yellowish or smoky-brown; paraphyses filiform or clavate, straight or curved.

Type species, *Ascobolus miniatus* Crouan.

KEY TO THE SPECIES

Plants small, not exceeding 5 mm. in diameter (usually 1 or 2 mm.).
Spores rough (reticulate, spinulose, verrucose, tuberculate, or annulate).
Spores marked with ridges.
Ridges giving rise to reticulations (net-like markings over the surface).
Reticulations shallow, barely roughening the surface of the spore.
Spores at maturity 20–22 μ in diameter, ridges of reticulations about 1 μ thick. 1. *L. Crouani.*

Spores at maturity 12–15 μ in diameter, reticulations very delicate, scarcely more than lines over the surface of the spore. 2. *L. dictydiola.*

Reticulations deep, extending 2 μ or more beyond the periphery of the spore and appearing as a broad band about its surface. 3. *L. areolata.*

Ridges not giving rise to reticulations.

Ridges usually curved and extending in various directions as in some species of *Ascobolus.* 4. *L. ascoboloides.*

Ridges giving rise to two distinct rings about the spore. 5. *L. annulata.*

Spores not marked with ridges.

Spores covered with spines.

Plants not exceeding 1 mm. in diameter, spines short, blunt. 6. *L. spinulosa.*

Plants at maturity 3–5 mm. in diameter, spines long and very sharp. 7. *L. Crec'hqueraultii.*

Spores covered with warts or tubercles.

Tubercles large, twelve or rarely fourteen or fifteen about the circumference of the spore.

Individual tubercles not rough. 8. *L. tuberculata.*

Individual tubercles covered with minute roughenings, giving them a translucent appearance. 9. *L. Maireana.*

Tubercles small, about twenty or more in the circumference of the spore.

Spores subglobose, on bark among moss. 10. *L. Wrightii.*

Spores perfectly globose, on soil.

Plants pale orange. 11. *L. tuberculatella.*

Plants violaceous. 12. *L. amethystina.*

Spores smooth.

Plants pale orange.

About 3 mm. in diameter at maturity, crowded, on burnt ground. 13. *L. carbonaria.*

About 1 mm. or less in diameter, scattered, on damp soil. 14. *L. haemastigma.*

Plants bright red.

Several mm. in diameter, spores 15–18 μ in diameter, on damp soil. 15. *L. Constellatio.*

Less than 1 mm. in diameter, spores 8–9 μ in diameter, on foliage of *Sequoia.* 16. *L. gemma.*

Plants pallid or creamy. 17. *L. discoidea.*

Plants large, usually 5 mm. or more in diameter.
Plants dark colored, purple or brown to blackish.
Brown or blackish, occurring on burnt ground.
Spores rough.
Plants externally rough, spores about 18 μ in diameter. 18. *L. trachycarpa.*
Plants externally smooth, spores about 9 μ in diameter. 19. *L. nigrans.*
Spores smooth. 20. *L. leijocarpa.*
Plants dark purple. 21. *L. Planchonis.*
Plants bright colored, orange.
Spores rough. 22. *L. lobata.*
Spores smooth. 23. *L. polytrichina.*

1. **Lamprospora Crouani** (Cooke)

Ascobolus miniatus Crouan, Ann. Sci. Nat. IV. **10**: 197. 1858.
Not *A. miniatus* Preuss, Linnaea **24**: 147. 1851.
Ascobolus Crouani Cooke, Jour. Bot. **2**: 151. 1864.
Peziza Crouani Cooke, Grevillea **3**: 31. 1874.
Crouania miniata Fuckel, Symb. Myc. 320. 1869.
Lamprospora miniata De-Not. Comm. Critt. Ital. **1**: 388. 1864.
Aleuria Crouani Gill. Champ. Fr. Discom. 50. 1878.
Barlaea miniata Sacc. Syll. Fung. **8**: 111. 1889.

Plants gregarious, or crowded, at first subglobose, expanding and becoming plane or with the hymenium a little concave with a slightly elevated and often fringe-like margin, bright red, without and within, margin lighter, almost white, 1–5 mm. in diameter (usually about 3 mm. at maturity); asci cylindric or subcylindric, about 20–22 μ in diameter; spores 1-seriate, at first smooth and usually containing one large oil-drop, at maturity becoming delicovering the entire surface of the spore, meshes of the reticulacately roughened, roughenings taking the form of reticulations tions 2–4 μ, rarely 5 or 6 μ in diameter, ranging from 3–6-sided, with the sides usually of unequal length but occasionally giving rise to almost perfect hexagonal figures, ridges very even and delicate, less than 1 μ broad, the ridges giving rise to a perfect unbroken net-work about the spore and very shallow as indicated by the roughenings about the periphery of the spore, entire spore 15–22 μ in diameter (usually about 20–22 μ at maturity), hyaline; paraphyses thickened above and filled with orange granules.

On damp soil usually among moss plants.

TYPE LOCALITY: Brest, France.

DISTRIBUTION: New York to Colorado; also in Europe.

ILLUSTRATIONS: Ann. Sci. Nat. IV. **10**: *pl. 13, f. 44–47;* Cooke, Mycogr. *pl. 5, f. 17;* Gill. Champ. Fr. Discom. *pl. 52, f. 2.*

Crouan's type has not been seen but authentic specimens from M. C. Cooke's collection have been examined and found to agree with American specimens referred to this species. One collection in great abundance was made near New York City during the past season.

2. LAMPROSPORA DICTYDIOLA Boud. Hist. Class. Discom. 68. 1907

Plants gregarious or scattered, not crowded, expanding with the hymenium, becoming plane or nearly so and bordered with a delicate, ragged, fringe-like margin and more or less pitted and roughened, entirely orange without and within, about 1 mm. in diameter (in the living specimens examined); asci cylindric or subcylindric, about 18–20 μ in diameter and of variable length; spores 1-seriate, at first smooth and usually with one large oil-drop, at maturity becoming very delicately reticulate, meshes of the reticulations 1 μ or less in diameter and ridges appearing as single lines (when examined with a one sixth objective); entire spore 12–15 μ in diameter, hyaline; paraphyses enlarged above reaching a diameter of 5 μ, nearly straight or occasionally a little curved, never hooked as in some related species.

On charcoal which has been overgrown with mosses.

TYPE LOCALITY: Montmorency, France.

DISTRIBUTION: New York; also in Europe.

ILLUSTRATION: Boud. Ic. Myc. *pl. 403.*

Our specimens conform well with the illustration of this species by Boudier. The species has been collected twice but in each case not over two or three plants were found.

3. LAMPROSPORA AREOLATA Seaver, Mycologia **4**: 48. 1912

Plants gregarious, small, .5–1 mm. in diameter, at first globose, opening rather irregularly, at maturity with the hymenium plane or slightly convex, more or less roughened by the protruding asci, orange to bright red; asci cylindric, 15–22 μ in diameter and of variable length, tapering below into a stem-like base; spores 1-seriate, at first smooth, with usually one large oil-drop, becoming rough at maturity, roughenings taking the form of deep areolations, areolae 3–5 μ in diameter, 3–6-sided, often forming

nearly perfect hexagonal figures or with the sides of irregular length, 2–3 μ deep as indicated by the projecting ridges about the periphery of the spore, ridges thin scarcely more than 1 μ thick, entire spore including projections 18–20 μ in diameter, hyaline; paraphyses strongly thickened above.

On damp soil among mosses and algae.

TYPE LOCALITY: Yonkers, New York.

DISTRIBUTION: New York to Connecticut.

ILLUSTRATIONS: Mycologia 4: *pl. 57, f. 5–8.*

Since the publication of this species, it has been frequently collected about New York City. The largest plants seen are not over 1 mm. in diameter. The peculiar spore characters mentioned in the original description have been found to be constant in all of the specimens examined.

4. **Lamprospora ascoboloides** sp. nov.

Plants gregarious, at first globose and partially buried, gradually opening with the hymenium at first slightly concave, gradually becoming plane and at maturity convex with the margin indistinct, usually not exceeding 1 mm. in diameter and often smaller, closely nestling in little depressions in the substratum but never buried, entirely orange, externally slightly floccose, hymenium roughened by the protruding asci which are comparatively large, finally becoming pitted as a result of the collapsing of the empty asci, the hymenium often collapsing when dry becoming concave; asci cylindric-clavate, about 175–225 × 18–20 μ; spores at first smooth with one or two oil-drops gradually becoming rough, increasing in size, at maturity covered with irregular ridge-like markings; ridges straight or more often curved, several often parallel or extending in various directions and sometimes at right angles, occasionally branched, rarely a few running together giving rise to irregular and imperfect reticulations over a part of the spore but never completely or perfectly reticulate, ridges nearly 2 μ thick, markings resembling those of certain species of *Ascobolus,* 15–18 μ in diameter (usually about 17 μ at maturity), hyaline; paraphyses clavate, 5–6 μ in diameter at their apices.

Type collected on soil in Portland, Connecticut.

DISTRIBUTION: Connecticut, New York and Virginia.

The species has been frequently collected about New York City since the original collection was made in Portland, Connecticut. The species is distinguished by the peculiar *Ascobolus*-like markings of the spores.

5. **Lamprospora annulata** sp. nov.

Plants gregarious but not crowded, at first globose and partially immersed in the substratum becoming expanded and with the hymenium plane or nearly plane and more or less pitted and roughened, pale orange, .5 mm. to nearly 1 mm. in diameter; asci cylindric or subcylindric, rather abruptly attenuated below into a short much contorted pedicel, entire ascus about 200 μ long and about 20 μ in diameter, at first almost filled with the spores, in older asci the lower part stretching and becoming about equal in length to the spore-bearing portion; spores 1-seriate from the first, perfectly globose and smooth when young and containing a few small oil-drops and granules, 12–14 μ in diameter, with two small rings appearing at an early stage about the proximal and distal sides of the spore giving rise to four small circles where the rings pass about the periphery of the spore, rings increasing in size until they reach a thickness of about 3 μ, the surface of the spore becoming minutely verrucose with age, the rings at maturity giving the spore a short cylindric appearance with the axis of the cylinder parallel with the ascus, entire spore when mature about 16–18 μ in diameter, rings of about the same diameter and nicely fitted over the opposite sides of the spore, the two rings usually parallel but occasionally one of them shifted out of its normal position, hyaline; paraphyses thickened above and densely filled with large granules, about 5 μ in diameter at the widest point.

On soil among moss and algae.

TYPE LOCALITY: Portland, Connecticut.

DISTRIBUTION: New York and Connecticut.

In addition to the type of this species which was collected in Portland, Connecticut, August, 1913, one collection was later made near New York City. This last collection consisted of three plants each less than one millimeter in diameter. The spore characters were identical with those of the Connecticut specimen.

6. **Lamprospora spinulosa** sp. nov.

Plants gregarious, minute, usually not exceeding 1 mm. in diameter and often less, at first closed and nearly globose, gradually expanding at maturity with the hymenium slightly convex and surrounded by an irregular fringe-like margin, externally slightly floccose, hymenium roughened by the asci which protrude

often half their length above the paraphyses, collapsing after discharging their spores; asci clavate-cylindric, about 200 × 18–20 μ; spores at first smooth with one large oil-drop, becoming delicately roughened, at maturity with short stout spines, about 1 μ in diameter and 2–3 μ in length, becoming adpressed when dry, entire spore about 15–20 μ in diameter (including spines), hyaline; paraphyses clavate, septate and granular within.

On soil among moss. New York Botanical Garden, 1912.

This plant which is 1 mm. or less in diameter has often been collected about New York City. The spores as well as the external characters of the species are very different from *L. Crec'hqueraultii* another spinulose-spored species. I find no description of the species.

7. LAMPROSPORA CREC'HQUERAULTII (Crouan) Boud. Ic. Myc. expl. pl. 11. 1909

Ascobolus Crec'hqueraultii Crouan, Ann. Sci. Nat. IV. **10**: 194. 1858.

Peziza modesta Karst. Act. Fauna Fl. Fenn. **10**: 122. 1869.

Peziza echinosperma Peck, Ann. Rep. N. Y. State Mus. **24**: 95. 1872.

Peziza auriflava Cooke, Mycogr. 16. 1875.

Aleuria auriflava Gill. Champ. Fr. Discom. 50. 1879.

Mollisia Crec'hqueraultii Gill. Champ. Fr. Discom. 118. 1882.

Crouania asperella Rehm, Hedwigia **24**: 226. 1885.

Humaria Crec'hqueraultii Quél. Enchir. 288. 1886.

Barlaea Crec'hqueraultii Sacc. Syll. Fung. **8**: 113. 1889.

Barlaea asperella Sacc. Syll. Fung. **8**: 113. 1889.

Barlaea modesta Sacc. Syll. Fung. **8**: 113. 1889.

Humaria echinosperma Sacc. Syll. Fung. **8**: 130. 1889.

Plicariella modesta Lindau in E. & P. Nat. Pfl. **1**²: 180. 1897.

Plants gregarious, 2–5 mm. in diameter (usually 2 or 3), entirely smooth without and within, hymenium at first slightly concave becoming plane or more often convex, margin indistinct in mature plants and entire plant often becoming irregular in form, very pale orange externally and internally, fading to dirty yellowish-white in dried specimens; asci cylindric, or subcylindric, about 300–325 × 27 μ protruding above the hymenium; spores 1-seriate, at first smooth, at maturity spinulose, globose, or rarely

very slightly elongated, spines conspicuous, irregular in length, broad at the base and tapering to a very sharp point at the apex, often 2 or 3 μ long, in dried specimens becoming bent and adpressed to the sides of the spore but regaining their normal form when wet, entire spore 18–22 μ in diameter (including spines), hyaline; paraphyses thickened at their apices.

On clayey soil.

TYPE LOCALITY: Europe.

DISTRIBUTION: New York to Delaware, West Virginia and Colorado; also in Europe.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. **24**: *pl. 3, f. 10–13;* Ann. Sci. Nat. IV. **10**: *pl. 13, f. 12–15;* Boud. Ic. Myc. *pl. 404, 405;* Bull. Lab. Nat. Hist. State Univ. Iowa **6**: *pl. 12, f. 4;* Cooke, Mycogr. *pl. 6, f. 22, 23.*

EXSICCATI: Ellis, N. Am. Fungi *840* (as *Peziza echinosperma* Peck); Ellis, N. Am. Fungi *841* (as *Peziza modesta* Karst.); Clements, Crypt. Form. Colo. *115* (as *Detonia modesta*).

In addition to the synonyms previously published, the writer has examined cotype specimen of *Peziza echinosperma* Peck and finds it to be identical with the above.

8. LAMPROSPORA TUBERCULATA Seaver, Mycologia **4**: 47. 1912

Plants gregarious in small clusters, not crowded but rarely with two or three in close contact, at first globose and almost buried in the sandy soil on which they grow, when young tapering above or subconic in form, with the hymenium gradually expanding and at maturity plane or nearly so, often with a fringe-like border and roughened by the protruding asci which appear above as minute white spines, superficial but with the base still nestling in the substratum, about .5 mm. in diameter or rarely attaining a diameter of nearly 1 mm.; asci cylindric or subcylindric, slightly narrowed near the apex, and tapering below into a stem-like base, 25–28 μ in diameter and about 275–300 μ long; spores 1-seriate, at first smooth and usually with one large oil-drop, gradually becoming rough, at maturity very coarsely tuberculate, tubercles covering the surface of the spore and appearing about its margin like great lumps often projecting further in one place than another giving the spore an irregular outline, individual tubercles about 3–4 μ in diameter, giving rise to 12 or rarely 14 or 15 lobes about the periphery of the spore, entire spore 18–20 μ in diameter at maturity, hyaline; paraphyses en-

larged above attaining a diameter of 6 μ, filled with orange granules.

On soil in open places among mosses and algae.

TYPE LOCALITY: Woods near Yonkers, New York.

DISTRIBUTION: New York to Virginia.

ILLUSTRATIONS: Mycologia **4**: *pl. 57, f. 1–4.*

Numerous collections of this species have been made about New York City during the past season. The coarse tuberculate marking of the spores is a constant feature in all of the specimens examined.

9. **Lamprospora Maireana** sp. nov.

Plants gregarious, at first globose, becoming expanded, at maturity with the hymenium plane or slightly concave, entirely pale orange without and within, reaching a diameter of about 2 mm.; asci cylindric or subcylindric, gradually tapering below into a stem-like base, having a diameter of 30 μ at the broadest point and reaching a length of 300–325 μ; spores 1-seriate, perfectly globose, at first smooth, at maturity becoming roughened, roughenings taking the form of tubercles which are as large as 3–5 μ in diameter and appearing as scallops about the periphery of the spore, the tubercles bearing secondary roughenings which give to each a minutely roughened surface, and giving the whole spore a translucent effect, entire spore at maturity, about 23 μ in diameter, subhyaline; paraphyses strongly thickened at their apices, reaching a thickness of 8 μ.

On the ground among moss and algae.

TYPE LOCALITY: Algiers, North Africa.

DISTRIBUTION: New York; also in North Africa.

EXSICCATI: Maire, Myc. Bor. Africana *22* (as *L. tuberculata* Seaver).

This species was distributed by R. Maire as *L. tuberculata.* Close comparison however shows the two to be quite different. The plants are larger, the spores larger and the sculpturing of the spores quite different. The warts in the African species are not so prominent as in *L. tuberculata* and the secondary roughening of the tubercles does not occur in *L. tuberculata.* A single local collection has been made by the writer in which the spores agree with the specimen collected by Maire so that the species probably occurs in North America.

10. **Lamprospora Wrightii** (Berk. & Curt.)

Peziza Wrightii Berk. & Curt. Ann. Mag. Nat. Hist. III. **15**: 444. 1865.

Barlaea Wrightii Sacc. Syll. Fung. **8**: 112. 1889.

Humaria Wrightii Boud. Hist. Class. Discom. 68. 1907.

Plants gregarious or scattered, at first globose, becoming expanded with the hymenium plane or slightly concave, surrounded by a delicate irregular elevated margin giving it a fringe-like border, entirely pale orange, slightly paler externally and minutely roughened; asci cylindric or slightly clavate; spores usually 1-seriate or irregularly crowded, globose or more often just slightly ellipsoid, at first smooth, with one or sometimes several oil-drops, becoming roughened at maturity, roughenings taking the form of small wart-like bodies, which are usually rather widely scattered over the surface of the spore, 15–17 μ in diameter, hyaline; paraphyses strongly enlarged above, filled with granules.

On bark of trees among moss.

TYPE LOCALITY: Bodelwyddan, Flintshire, Wales.

DISTRIBUTION: Alabama, Texas and Cuba; also in Europe.

ILLUSTRATIONS: Ann. Mag. Nat. Hist. III. **15**: *pl. 15, f. 16;* Boud. Ic. Myc. *pl. 399;* Cooke, Mycogr. *pl. 5, f. 18.*

The spores were originally described as echinulate but this may have been due to faulty observation since later students of the type describe the spores as verrucose. An Alabama specimen examined agrees perfectly with Boudier's illustration of this species.

11. **Lamprospora tuberculatella** sp. nov.

Plants gregarious but never crowded, often five or six plants in the space of 1 cm., at first globose, opening at the top and gradually expanding, at maturity discoid, convex above and floccose with the asci which protrude above the hymenium half their length appearing as many minute white spines, whole plant pale orange, .3–.5 mm. in diameter or rarely reaching a diameter of 1 mm.; asci cylindric or subcylindric; spores 1-seriate, at first smooth and with one large oil-drop near the center, increasing in size as they mature, at maturity about 20 μ in diameter and covered with small tubercle-like markings, tubercles covering the surface of the spore and appearing beyond the periphery of the

spore like those of *L. tuberculata* but much smaller, about twenty to twenty-five around the circumference of the spore, hyaline; paraphyses enlarged above and filled with orange granules.

On soil among moss near Yonkers, New York.

This species has been frequently collected and much attention has been given to a study of the spore characters. As might at first be thought, the small wart-like markings have never been found to intergrade with those of *L. tuberculata* in which they are twice as large.

12. **Lamprospora amethystina** (Quél.)

Humaria Personii amethystina Quel. Fr. Acad. Sci. **14**: 451. 1885.

Barlaea amethystina Sacc. Syll. Fung. **8**: 116. 1889.

Plants gregarious, purplish, without and within, with a delicate white border, hymenium a little concave, reaching a diameter of 2 mm.; asci cylindric or subcylindric; spores 1-seriate, at first smooth, becoming rough at maturity, spore markings similar to those of *L. tuberculatella*, hyaline; paraphyses a little enlarged at their apices.

On the ground among moss.

TYPE LOCALITY: Jura, France.

DISTRIBUTION: Iowa; also in Europe.

ILLUSTRATIONS: Bull. Lab. Nat. Hist. State Univ. Iowa **6**: *pl. 12, f. 3*.

The only specimens of this species seen were those collected by the writer in Iowa. The species is distinguished by its color.

13. **Lamprospora carbonaria** (Fuckel)

Crouania carbonaria Fuckel, Symb. Myc. (Nachtrag) 64. 1871.
Peziza sanguinaria Cooke, Grevillea **3**: 31. 1874.
Barlaea carbonaria Sacc. Syll. Fung. **8**: 112. 1889.
?Lamprospora carbonicola Boud. Hist. Class. Discom. 68. 1907.

Plants gregarious or crowded, 1–3 mm. in diameter, globose, becoming expanded with the hymenium plane or slightly concave and margin even or wavy, plants often irregular in form from mutual pressure, entirely pale orange, hymenium nearly even or

slightly floccose; asci cylindric-clavate, about 225 × 18–20 μ; spores perfectly globose and smooth with one oil-drop varying in size but often almost filling the spore, entire spore 15–18 μ in diameter, hyaline; paraphyses filiform or slightly enlarged at their apices, extending high above the asci and curved or hooked, about 3–4 μ in diameter at their apices.

On soil among moss plants in a place which has been recently burned but subsequently partially overgrown with moss.

TYPE LOCALITY: Oestrich and Budenheim woods, Germany.

DISTRIBUTION: New York; also in Europe.

Through the courtesy of Dr. Farlow, I have been permitted to examine spores of cotype material of this species. Specimens collected in the New York Botanical Garden agree with Fuckel's plants so far as we can judge from dried specimens. The species has been seen by the writer only once but occurred in good quantity.

14. **Lamprospora haemastigma** (Hedw.)?

Octospora haemastigma Hedw. Laub-Moose **2**: 17. 1788.
Pulvinula haemastigma Boud. Hist. Class. Discom. 70. 1907.

Plants rather thickly gregarious, rarely two or three in close contact, at first globose, becoming expanded with the hymenium plane or slightly concave, entirely pale yellow (becoming brighter in dried specimens), about 1 mm. in diameter; asci cylindric or subcylindric, 20–23 μ in diameter and as long as 300 μ; tapering below into a stem-like base; spores 1-seriate, smooth, usually with one large oil-drop, about 20 μ in diameter, hyaline; paraphyses very slender, strongly curved at their apices and scarcely thickened above, about 2 μ in diameter at the thickest point, densely filled with yellow granules.

On damp soil among moss.

TYPE LOCALITY: Europe.

DISTRIBUTION: New York; also in Europe.

ILLUSTRATIONS: Hedw. Laub-Moose **2**: *pl. 5, f. 1–5;* Boud. Ic. Myc. *pl. 406.*

Our plants agree well with Boudier's illustrations of what he takes to be Hedwig's species. It also agrees fairly well with Hedwig's illustration although the plants are somewhat paler. The species differs from *L. Constellatio* by the smaller size of the plants and much paler color.

15. **Lamprospora Constellatio** (Berk. & Br.)

Peziza Constellatio Berk. & Br. Ann. Mag. Nat. Hist. IV. **17**: 142. 1876.

Leucoloma Constellatio Rehm, Ber. Naturh. Ver. Augsburg **26**: 5. 1881.

Pulvinula Constellatio Boud. Bull. Soc. Myc. Fr. **1**: 107. 1885.

Aleuria Constellatio Gill. Champ. Fr. Discom. 207. (1888?)

Barlaeina Constellatio Morgan, Jour. Myc. **8**: 188. 1902.

Plants gregarious or scattered, at first globose, becoming expanded and plane or slightly concave, 1–5 mm. in diameter, hymenium bright red, color becoming brighter in dried specimens, often almost scarlet, externally lighter; asci cylindric or subcylindric, about 250–300 × 20 μ; with a long stem-like base; spores smooth with one large oil-drop often surrounded by numerous smaller ones, hyaline, 15–20 μ (usually about 18) in diameter, hyaline; paraphyses filiform, only slightly thickened at the ends and very much hooked and curved, entirely filled with red granules and sparingly septate.

On bare ground in rich soil.

TYPE LOCALITY: Addington, Kent, Great Britain.

DISTRIBUTION: New Jersey to Ontario, Colorado and Jamaica; also in Europe.

ILLUSTRATIONS: Boud. Ic. Myc. *pl. 407;* Cooke, Mycogr. *pl. 21, f. 81.*

EXSICCATI: Ellis & Ev. N. Am. Fungi *2036.*

I have not seen the type of this species but American specimens conform well with European illustrations and exsiccati. The species was frequently collected by the writer in the Rocky Mountains and has been less frequently collected in the East.

16. **Lamprospora gemma** (Phill.)

Peziza gemma Phill. Grevillea **7**: 21. 1878.

Barlaea gemma Sacc. Syll. Fung. **8**: 112. 1889.

Plants gregarious, sessile, fleshy, subturbinate, finally expanded with the hymenium plane or slightly concave, asci cylindric; spores 1-seriate, globose, smooth, hyaline, about 8 μ in diameter; paraphyses filiform, very slender and branched, straight or more or less curved at their apices.

On decaying foliage of *Sequoia sempervirens.*

TYPE LOCALITY: California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Cooke, Mycogr. *pl. 111, f. 398.*

A specimen of this species collected by Harkness in California has been examined. The species differs from *L. Constellatio* in the much smaller size of the spores. The plants are also much smaller.

17. **Lamprospora discoidea** (P. Henn. & E. Nym.)

Barlaea discoidea P. Henn. & E. Nym. Monsunia **1**: 33. 1900.
Barlaeina discoidea Sacc. Syll. Fung. **16**: 710. 1902.

Plants scattered or gregarious, sessile, at first subglobose, expanding leaving the margin elevated and hymenium slightly concave, but soon becoming plane and later strongly convex, minutely roughened by the protruding asci, entire plant reaching a maximum of 2 mm. in diameter (usually 1 mm. in diameter at maturity), color white or grayish white or with a slight tinge of yellow or cream; asci subcylindric above, tapering below into a slender stem-like base which is usually forked, about 200–250 × 20 μ; spores 1-seriate, smooth, with one large oil-drop which nearly fills the spore, rather thick-walled, 15–20 μ in diameter (usually about 17 μ), hyaline; paraphyses slender, slightly enlarged upwards, about 5 μ in diameter at their apices.

On rather sandy soil or among moss.

TYPE LOCALITY: Java.

DISTRIBUTION: New York; also in Asia.

The pale color is the distinguishing character of this species, which was found to be very common in the New York Botanical Garden during the past season. It is very different in appearance from any of the other species here described.

18. **Lamprospora trachycarpa** (Curr.)

Peziza trachycarpa Curr. Trans. Linn. Soc. **24**: 493. 1864.
Peziza scabrosa Cooke, Mycogr. 170. (1879?)
Discina trachycarpa Karst. Act. Fauna Fl. Fenn. **2**: 113. 1885.
Plicaria trachycarpa Boud. Bull. Soc. Myc. Fr. **1**: 102. 1885.
Aleuria trachycarpa Gill. Champ. Fr. Discom. 207. (1888?)
Detonia trachycarpa Sacc. Syll. Fung. **8**: 105. 1889.

Phaeopezia scabrosa Sacc. Syll. Fung. **8**: 472. 1889.
Plicariella trachycarpa Rehm, Rabenh. Krypt. Fl. **1**[3]: 996. 1896.

Plants gregarious or densely crowded, often forming continuous masses extending over many cm., at first globose, gradually opening above and becoming shallow cup-shaped with the margin incurved and elevated or more rarely closely adhering to the substratum, regular in form or cochleate and becoming very irregular especially when closely crowded, hymenium smooth or convolute, dark reddish-brown or slightly olivaceous, becoming black in dried specimens, externally lighter colored and rough, often densely verrucose, 5 mm. to 2 cm. in diameter; asci cylindric or subcylindric, about 15–18 μ in diameter and of variable length but often reaching 250–300 μ; spores 1-seriate, at first smooth, becoming rough, roughenings taking the form of small tubercles or often elongated, appearing like very short interrupted ridges, becoming pale yellowish or smoky at maturity, about 15–18 μ in diameter; paraphyses thickened above and adhering more or less together at their apices, yellowish-brown.

On burnt ground and charcoal beds.

TYPE LOCALITY: Ascot Heath, Great Britain.

DISTRIBUTION: New York to Colorado; also in Europe.

ILLUSTRATIONS: Boud. Ic. Myc. *pl. 300;* Bull. Lab. Nat. Hist. State Univ. Iowa **6**: *pl. 14, f. 1;* Cooke, Mycogr. *pl. 67, f. 257;* Trans. Linn. Soc. **24**: *pl. 51, f. 3, 5.*

Cotype material of this species has been examined. Also cotype material of *Peziza scabrosa* Cooke has been examined and found to be identical. The species is common.

19. **Lamprospora nigrans** (Morgan)

Peziza nigrans Morgan, Jour. Cin. Soc. Nat. Hist. **18**: 43. 1895.
Detonia nigrans Sacc. Syll. Fung. **14**: 747. 1899.

Plants at first cup-shaped and circular in outline, becoming plane and more or less irregular, hymenium black or blackish, externally smoky-pallid and smooth, attached to the soil by slender fibers, reaching a diameter of 1 or 2 cm.; asci cylindric or subcylindric and much elongated; spores 1-seriate, at first smooth, becoming rather coarsely warted and reaching a diameter of about 9 μ, subhyaline to smoky-brown; paraphyses thickened above and dark colored.

On burnt ground.

TYPE LOCALITY: Preston, Ohio.

DISTRIBUTION: Known only from the type locality.

The species is distinguished from *L. trachycarpa* to which it is closely related by the smooth exterior of the plants and the very small size of the asci and spores. Cotype material has been studied.

20. **Lamprospora leiocarpa** (Curr.)

Peziza leiocarpa Curr. Trans. Linn. Soc. **24**: 493. 1864.
Plicaria foveata Fuckel, Symb. Myc. 326. 1869.
Detonia leiocarpa Sacc. Syll. Fung. **8**: 105. 1889.
Detonia foveata Sacc. Syll. Fung. **8**: 105. 1889.
Plicaria leiocarpa Rehm, Rabenh. Krypt. Fl. 1^3: 994. 1896.

Plants gregarious, at first globose and closed, opening and becoming shallow cup-shaped, at length almost entirely flattened, and irregularly undulated and lobed, hymenium olivaceous-brown; asci clavate, becoming subcylindric; spores at first irregularly 2-seriate, becoming 1-seriate at maturity, globose, hyaline, remaining entirely smooth, usually with one large oil-drop, about 10–12 μ in diameter; paraphyses enlarged above and adhering together.

On burnt ground.

TYPE LOCALITY: Ascot Heath, Great Britain.

DISTRIBUTION: California; also in Europe.

ILLUSTRATIONS: Trans. Linn. Soc. **24**: *pl. 51, f. 4, 6;* Boud. Ic. Myc. *pl. 304.*

Cotype material of this species has been examined. The only American specimens examined were collected by Dr. Harkness in California. This species differs from *L. trachycarpa,* which it resembles, in having permanently smooth spores.

21. **Lamprospora Planchonis** (Dun.)

Plicaria Planchonis Dun.; Boud. Bull. Soc. Myc. Fr. **3**: 92. 1887.

Plants gregarious or scattered, sessile, hemispherical or nearly plane, usually regular in form but occasionally irregularly contorted, margin rough, exterior of cups minutely roughened or warted, entire plant very dark purple, exterior almost black, hymenium a little lighter, flesh with transmitted light bright

purple and both asci and paraphyses surrounded with purple coloring matter which can be partially extracted with water from the dried plants, 5–8 mm. in diameter; asci cylindric, with a slender stem, about 200 × 13–15 μ; spores 1-seriate, perfectly globose, at first hyaline with one and sometimes several oil-drops, becoming pale purplish (as are also the paraphyses and asci), smooth or very minutely roughened, at maturity about 10–12 μ in diameter; paraphyses clavate, about 6 μ in diameter at their apices, filled with purple granules.

On sandy soil by roadsides, hillsides and on sand-dunes.

TYPE LOCALITY: France.

DISTRIBUTION: Common in the Bermudas; also in Europe.

ILLUSTRATIONS: Bull. Soc. Myc. Fr. **3**: *pl. 8;* Boud. Ic. Myc. *pl. 309.*

This little purple fungus is the commonest cup-fungus in the Bermudas, occurring by roadsides and on hillsides in pastures and open places. Numerous collections were made by Stewardson Brown, N. L. Britton and the writer during the winter of 1912. So far as I am aware, this is the first record of the species from North America. A closely related species, *Peziza Persoonii,* is said to differ in having rough spores. No specimen of the latter species has been seen by the writer from North America.

22. **Lamprospora lobata** (Berk. & Curt.)

Peziza lobata Berk. & Curt. Jour. Linn. Soc. **10**: 365. 1869.
Barlaea lobata Sacc. Syll. Fung. **8**: 117. 1889.

Plants scattered, and shallow cup-shaped to nearly plane or with the margin slightly elevated and undulated or lobed; hymenium dull orange, paler below, about 5–12 mm. in diameter; asci cylindric or subcylindric, 15–18 μ in diameter and of variable length but usually about 250 μ; spores 1-seriate, at first smooth, becoming rough at maturity, roughenings consisting of four to six tubercles of variable size which appear beyond the periphery of the spore and with several more or less indistinct lines or bands extending across the surface of the spore in various directions resembling pieces of coarse twine wound about its surface, the inequality in the size of the tubercles giving the mature spore a rather irregular form, entire spore 12–15 μ in diameter, hyaline; paraphyses very slender, about 1–2 μ in diameter and scarcely enlarged at their apices.

On the ground.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Cooke, Mycogr. *pl. 69, f. 265.*

A cotype specimen of this species has been studied. The species is well-marked by its size and by the peculiar markings of the spores, which are not mentioned in the original description.

23. **Lamprospora polytrichina** (Rehm)

Detonia polytrichina Rehm, Krypt. Fl. **1**[3]: 1269. 1896.

Plants gregarious, sessile, expanding, becoming nearly plane or shallow cup-shaped, margin entire and often wavy, reaching a diameter of 5 mm., hymenium bright orange, externally lighter, whitish and more or less pruinose; asci cylindric or subcylindric, gradually tapering near the base, reaching a length of 200–225 μ and about 17 μ thick near the apex; spores 1-seriate, entirely globose, with one or sometimes several oil-drops, smooth, hyaline, 15–17 μ in diameter; paraphyses slender, slightly enlarged above, straight or slightly curved.

On soil among moss, especially *Polytrichum.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Minnesota; also in Europe.

ILLUSTRATIONS: Cooke, Mycogr. *pl. 13, f. 50.*

The only specimens of this species examined from America were those collected by Miss Hone in Minnesota (No. *938*). The species has been confused with *Peziza Polytrichi* Schum.

DOUBTFUL SPECIES

Peziza exasperata Berk. & Curt. Grevillea **3**: 152. 1874.

The plants are described as one-half inch across, externally warted and with the margin inflexed, spores rough and about 12 μ in diameter.

The species was collected in Alabama by Peters.

Peziza globifera Berk. & Curt. Jour. Linn. Soc. **10**: 366. 1869.

A Cuban species with smooth spores. My only knowledge of this and the preceding species is based on the examination of microscopic slide of the spores.

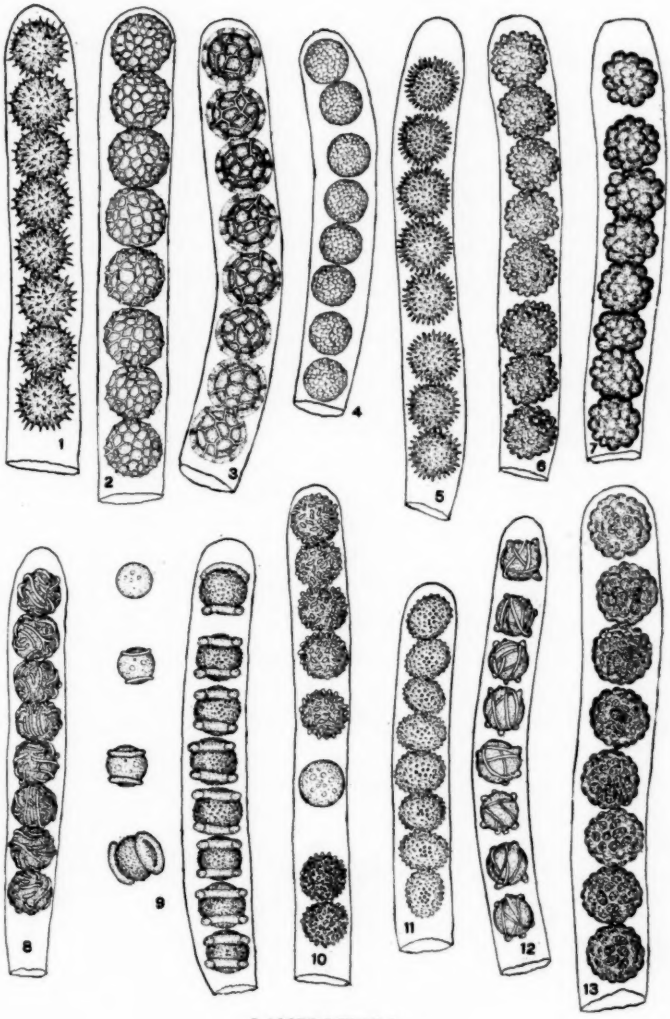
Barlaea lacunosa Ellis & Ev. Proc. Acad. Nat. Sci. Phila. **1894**: 347. 1895.

This species was described from material collected on the bark of some coniferous tree in Newfoundland. The type has been studied and both the habitat and general characters of the plant indicate that it is a *Pithya*, which genus is rather closely related to *Lamprospora*. Whether it is a distinct species I am unable to say. The plants are larger and more convolute than most specimens of *Pitya vulgaris* Fuckel, but some specimens of this species approach it in size. If it is not the same species, Ellis's plant is at least very closely related to *P. vulgaris*.

EXPLANATION OF PLATE CXIV

This plate contains spores of the following species of *Lamprospora* drawn with the aid of the camera lucida to a common scale.

1. *Lamprospora Crec'hqueraultii* (Crouan) Boud.
2. *Lamprospora Crouani* (Cooke) Seaver.
3. *Lamprospora areolata* Seaver.
4. *Lamprospora dictydiola* Boud.
5. *Lamprospora spinulosa* Seaver.
6. *Lamprospora tuberculatella* Seaver.
7. *Lamprospora tuberculata* Seaver.
8. *Lamprospora ascoboloides* Seaver.
9. *Lamprospora annulata* Seaver.
10. *Lamprospora trachycarpa* (Curr.) Seaver.
11. *Lamprospora Wrightii* (Berk. & Curt.) Seaver.
12. *Lamprospora lobata* (Berk. & Curt.) Seaver.
13. *Lamprospora Maireana* Seaver.



LAMPROSPORA

NOTES ON UREDINOPSIS MIRABILIS AND OTHER RUSTS

W. P. Fraser

A few culture experiments were carried on during the season of 1913, and, though nothing new was established by these cultures, yet, since some of them confirm important results that rest only on the previous experiments and observations of the writer, a brief record may be of interest.

Little culture material could be found in the vicinity of Macdonald College, so that the writer was dependent on the generosity of the following who contributed material for the experiments: Professors R. Matheson and H. W. Smith, of the Nova Scotia Agricultural College, Truro; Mr. Robert Inglis, Pictou, N. S.; Miss Muriel Macrae, Durham, N. S.; and Mr. W. H. Brittain, Plant Pathologist of British Columbia. To these, the writer wishes to express his sincere thanks.

Uredinopsis mirabilis (Peck) Magn.

Teliosporic material of this rust collected at Truro, N. S., was placed in a moist chamber until the teliospores were germinating freely. It was then suspended above a young plant of *Abies balsamea* (L.) Mill. on May 15th. Pycnia were present on the leaves on May 23d and aecia in abundance on June 1st. Another sowing on May 15th gave pycnia on May 25th followed by abundant aecia. A third sowing on May 16th was followed by pycnia on May 27th and aecia by June 3d, both in abundance. Two other sowings were made later with success, but the infection was not so marked, probably owing to the shoots being more mature. Six plants of *Abies balsamea* obtained at the same time and place were kept as checks and remained free from infection.

The species of the genus *Uredinopsis* are not separated by any marked morphological differences, also a number of them have

their aecia on *Abies balsamea,* so the question arises whether they are distinct or should be included under one species. To obtain cultural evidence bearing on this matter, the following experiments were made.

The aeciospores of *Uredinopsis mirabilis* obtained by the experiment just described were placed in distilled water, and by means of an atomizer were sown on the following ferns on June 14th: *Onoclea sensibilis* L., *Aspidium Thelypteris* (L.) Sw., *Osmunda Claytoniana* L., *O. regalis* L., *Phegopteris Dryopteris* (L.) Fée. Uredinia were noticed on June 21st on *Onoclea sensibilis* and soon became abundant. There was no infection of the other ferns. Another sowing on June 16th of culture aeciospores on *Onoclea sensibilis, Asplenium Filix-femina* (L.) Bernh., *Osmunda Claytoniana* and *Aspidium Thelypteris* gave abundant uredinia on *Onoclea sensibilis* by June 24th, but no infection of the others. A third sowing on June 26th on *Aspidium Thelypteris, Asplenium Filix-femina, Onoclea sensibilis* and *Phygopteris Dryopteris* was followed by abundant uredinia on *Onoclea sensibilis* but no infection of the other plants. A number of checks of *Onoclea sensibilis* remained free from infection.

These experiments confirm the work of last year and indicate clearly that *Uredinopsis mirabilis* is a distinct species.[1]

MELAMPSORA MEDUSAE Thüm.

Teliosporic material of this rust collected near Pictou, N. S., was sown on young trees of *Tsuga canadensis* on May 28th. Pycnia were present by June 5th, and aecia were first noticed appearing on June 8th, both in great abundance. Five trees kept as checks showed no infection. Branches of *Tsuga canadensis* bearing cones were placed in water and germinating teliosporic material suspended above the cones on June 20th. Pycnia were present on the cones on June 27th and were soon abundant, but only one matured aecia. Doubtless the failure to mature aecia was due to the unhealthy condition of the cones, most of them dying before the aecia had time to mature.

Attempts were made to infect *Larix laricina* (Du Roi) Koch. in the field, but without success. Two sowings of germinating

[1] See MYCOL. 4: 236. 1913.

teliosporic material on a flourishing young tree of the same species in the laboratory also failed.

From field observations and culture experiments described in this and previous papers, the writer concludes that the *Melampsora* on *Populus grandidentata* in eastern Canada has its aecia on the leaves, young twigs and cones of *Tsuga canadensis* and does not infect *Larix laricina*.[2] It may be that the rust on *Populus grandidentata* is a distinct species as Arthur[3] has shown that *Melampsora Medusae* on *P. deltoides* and *P. tremuloides* has aecia on *Larix*, but for the present it seems best to regard it as a specialized form of *Melampsora Medusae*. Attempts to infect *Populus deltoides* with the aeciospores obtained from the culture failed.

PUCCINIASTRUM MYRTILLI (Schum.) Arth.

Teliosporic material of this rust on *Gaylussacia resinosa* (Ait.) T. & G., collected at Isle Perrot, P. Q., was sown on *Tsuga canadensis* on May 28th. Pycnia were present on June 9th and aecia on June 16th, both in abundance.[4]

CALYPTOSPORA COLUMNARIS (Alb. & Schw.) Kühn

Germinating teliosporic material of this rust on *Vaccinium pennsylvanicum* Lam., collected at Pictou, N. S., was sown on *Abies balsamea* on May 15th. Aecia were noticed on June 3d and were mature by June 12th. No pycnia were formed.[5]

PERIDERMIUM HARKNESSII Moore

Attempts were made with the aeciospores of this form collected at Vernon, B. C., to infect *Commandra umbellata* (L.) Nutt., but without success. It was doubtful, however, if the aeciospores were in good condition when sown.

SUMMARY OF CULTURES DESCRIBED IN THIS ARTICLE

Uredinopsis mirabilis Magn. Five successful sowings of teliospores from *Onoclea sensibilis* L. on *Abies balsamea* (L.) Mill.

[2] See MYCOL. **3**: 188. 1912; **5**: 238. 1913.
[3] Jour. Myc. **10**: 13. 1904; **11**: 52. 1905; **12**: 13. 1906.
[4] See MYCOL. **5**: 237. 1913.
[5] See MYCOL. **4**: 177. 1912.

Three successful sowings of culture aeciospores on *Onoclea sensibilis* L. but failure to infect *Osmunda Claytoniana* L., *Osmunda regalis* L., *Aspidium Thelypteris* (L.) Sw., *Asplenium Filix-femina* (L.) Bernh., and *Phegopteris Dryopteris* (L.) Fée.

Melampsora Medusae Thüm. Teliospores from *Populus grandidentata* Michx., infected *Tsuga canadensis* (L.) Carr, but failed to infect *Larix laricina* (DuRoi) Koch.

Pucciniastrum Myrtilli (Schum.) Arth. Teliospores from *Gaylussacia resinosa* (Ait.) T. & G., infected *Tsuga canadensis* (L.) Carr.

Calyptospora columnaris (Alb. & Schw.) Kühn. Teliospores from *Vaccinium pennsylvanicum* Lam., infected *Abies balsamea* (L.) Mill.

MACDONALD COLLEGE,
PROVINCE OF QUEBEC.

OBSERVATIONS ON THE USE OF RIDGWAY'S NEW COLOR-BOOK.[1,2] THE COLOR OF THE SPORES OF VOLVARIA SPECIOSA FR.

L. C. C. Krieger

In using the recently published book, "Color Standards and Color Nomenclature," by Ridgway, the writer was confronted with certain difficulties which operate against exactness in color determination, viz.: the appearance of the complementary of an adjacent color in the one under observation; the darkening or lightening effects of backgrounds of varying degrees of luminosity; and the effect of area on colors.

As these difficulties will be encountered by others who may have occasion to consult this valuable repository of color tones, an account of some tests will doubtless prove of interest.

The writer wished to ascertain the precise color of a spore-print of the gill-fungus, *Volvaria speciosa* Fr. The print was about 15 cm. in diameter, and so dense as to cover completely the white paper underneath. On comparing the entire area of the print with the small color squares in the book, it was found that a tone somewhere between *l* and *k* of column 13, Pl. *III*, corresponded with the tone of the spore-deposit.[3]

[1] Color Standards/and/Color Nomenclature/by/Robert Ridgway, M.S., C.M.Z.S., etc./Curator of the Division of Birds, United States/National Museum./With Fifty-three Colored Plates/and/Eleven Hundred and Fifteen Named Colors./Washington, D. C./1912./Published by the Author./(8 mo., colored frontispiece, pp. (I) II–III (IV), (1) 2–43 (44). Reviewed by P. L. Ricker in Mycologia **5**: 172–174. March, 1913.)

[2] While the discussion here presented is confined to Ridgway's book, the deductions are applicable to any work which attempts to standardize colors by giving the colors themselves.

[3] The tests here recorded were conducted in a room, near a good-sized window in the north wall. Sky clear. No other illumination. No reflections from strongly colored objects outside. Wall-paper and near-by objects not conspicuous in color. Every test was verified by two persons.

But having learned, through experience, that colors appear brighter when spread over large surfaces than when confined to smaller ones, it was decided to cover the spore-print entirely with a piece of white paper measuring 15.5 cm. by 29 cm., and provided in the center with an aperture of the exact size of the color squares; a contrivance known as an excluder. Placing this excluder over the print so that only a small patch of the spore-covered surface showed, and then comparing this patch with the squares, it was learned that the tone 13 *m* on Pl. *III* matched perfectly, the reduction in area having had a darkening effect.

For the next test, a piece of carbon paper of the same size as the white sheet was procured, and, after providing it with an aperture of the same dimensions as the other, comparison was made. This time the spores agreed exactly with square *i*, column 13′, pl. *XV*, a tone, it will be noticed, very much lighter than either of those determined upon in the foregoing tests.

Finally, it was concluded to equalize conditions absolutely, both as to size of aperture and color of paper. Two sheets of the identical color of the mounts in Color Standards, cut to the size adopted for these tests, were applied, one to the print, the other to the squares, with the result that the spore-color tallied accurately with 13′ *k*, on Pl. *XV*,—again a different tone.

These tests may be repeated by anyone who will follow the methods described. Any color will answer the purpose, though a critical one, such as an indeterminate brown of medium depth, will exhibit the mutations more markedly. With excluders of a lively color the effect is quite surprising, as another set of tests with a sheet colored Cendre Green (Pl. *VI*, 35 *b*) demonstrates.

Except for the color, the sheet was in every respect like those used previously, but before applying it, an experiment was performed that again exhibited the effect of increased area on colors. It was found that when any part of the surface was brought in direct contact with the square of Cendre Green, the agreement was perfect; when, however, the surface was viewed as a whole, the color approximated rather closely Vanderpoel's Green (Pl. *VI*, 33 *b*), a yellower green than Cendre Green.

With this sheet the following changes were produced in some squares chosen at random:

Pl. *II* 11 *k* = Pl. *II* 9 *j*
Pl. *II* 11 *m* = Pl. *II* 9 *m*
Pl. *III* 15 *m* = Pl. *III* 13 *m* (almost)
Pl. *IV* 23 *f* = Pl. *IV* 21 *f*
Pl. *IV* 23 *k* = Pl. *IV* 20 *k*
Pl. *XXXIX* 5‴ *d* = Pl. *XXXIX* 1‴ *c*
Pl. *XL* 21‴ *f* = Pl. *XXXIX* 14‴ *e*

If one desired, tests might be carried on with sheets representing all of the colors of the spectrum, but in each test it would be found that the color tested had undergone a change of aspect, the degree and direction depending upon the color in juxtaposition. Indeed, by the use of a set of differently colored excluders a large number of new tones, each one a standard, might be obtained; but unfortunately, it would not be possible to turn these new tones to account, as the excluder, applied to the color to be compared, would itself have to be excluded, and without this important factor, comparison would be reduced to the hit-or-miss method we are endeavoring to eliminate.

In view of the discomforting deductions which cannot but be drawn from these tests, one is bound to accept the conclusion, long ago arrived at by artists, physicists, and others, that colors, as perceived by the human eye, are of an illusive nature and not fixed in the way generally supposed. This conclusion accepted, it behooves the devotees of the descriptive sciences to agree upon some means by the aid of which this source of error may be controlled.

The writer would suggest the issuing of two excluders (in supplementary form), each measuring 15.5 cm. by 29 cm., and colored to match the mounts in Color Standards. In the center of each, there should be an aperture of the size of the color squares. In addition, a note might be included enjoining the use of the excluders when accurate records are to be made. The note ought to state further, that users of the book, when referring to a tone, should indicate whether the excluders were employed. The abbreviation "+ std. excl." (plus standard excluders), added to a symbol, would suffice to show whether the observer had availed himself of this necessary adjunct in the work of color discrimination.

U. S. DEPARTMENT OF AGRICULTURE.

NEW OR INTERESTING FUNGI

DAVID ROSS SUMSTINE

(WITH PLATES 115–117, CONTAINING 16 FIGURES)

Hormisciopsis gen. nov.

Pulvinate, effused, gelatinous, collapsing when dry; mycelium well developed, filiform, branched; sporophore not differing from the mycelium, erect or suberect; spores in chains, bright-colored.

This genus differs from *Hormiscium* in its gelatinous character. In gross appearance it is not unlike some species of Tremellaceae, particularly species of *Exidia* or *Guepinia*. The manner of production of spores separates it entirely from this group.

Hormisciopsis gelatinosa sp. nov.

Pulvinate or effused, contorted, plicate, compact, appearing as though oozing out of the substratum, red to dark-red; mycelium filiform, branched; sporophores not differentiated from the mycelium; spores in chains, the chains branched, globose to ellipsoid, guttulate, somewhat granular, 5–6 × 6–10 μ.

On decayed wood, Fern Hollow, Allegheny Co., Pennsylvania, August, 1907.

The type specimens are in the Carnegie Museum, Pittsburgh, Pa.

Arthrosporium album sp. nov.

Plants gregarious, mycelium scanty; stroma conic or cylindric, 0.5–1 mm. high, white, composed of a fascicle of parallel hyphae, the fertile hyphae becoming free along the stroma or spreading above and forming a small head; spores borne on sterigmata on the swollen ends of the fertile hyphae; spores hyaline, 3-septate, guttulate, cylindric-fusiform, 5–8 × 25–30 μ.

On decayed log, Fern Hollow, Allegheny Co., Pennsylvania, 1912.

The genus *Arthrosporium* is used simply as a pigeonhole for this species. Its affinities are with several genera. It might be

placed with equal propriety in *Atractium* or *Harpographium*. *Atractium* differs from *Arthrosporium* in the shape of the spores; *Harpographium* differs in the colored hyphae and in the simple spores.

The type specimens are in the Carnegie Museum, Pittsburgh, Pa.

PHYLLOSTICTA ATRIPLICIS Desm.

From published descriptions, *Phyllosticta Atriplicis* Desm. and *Septoria Atriplicis* (West.) Fuckl. may be the same species. I have not seen the type specimens of either species and therefore cannot say definitely that such is the case, but specimens collected on leaves of *Atriplex hastata* L. during the summers of 1909, 1910, 1911, and 1912 may throw some light on the matter. The specimens were collected at different places in Wilkinsburg and always showed remarkable uniformity in growth and development.

The examination of fresh specimens showed pycnidia with long, guttulate, and apparently non-septate spores. The spores in old dry specimens appeared to be distinctly septate. This peculiar condition in spore character made the determination of the plants difficult. The long non-septate spores indicated the genus *Phoma* or *Macrophoma;* the older septate spores pointed to the genus *Septoria.*

It is probable that the septation in the older spores is due to the contraction of the protoplasmic mass in drying and therefore the septa are not true but only apparent.

Three species of *Phoma* are reported as growing on *Atriplex: Phoma longissima, Atriplicis, Westendorpii.* The spore measurements for these three species range from 4–10 μ in length. The spores in my specimens are more than twice that length and, consequently, cannot be referred to any of these species.

Phyllosticta Atriplicis Desm. is described as having spores cylindric, ovate, straight or curved, 3–6-guttulate. The length of the spores is not given. *Septoria Atriplicis* (West.) Fuckl. has cylindric or subfusoid spores, 4.5–5 × 25–35 μ, spuriously 1–2–3-septate. The spores in this latter species agree fairly well with the spores in my specimens. It may be possible, then, that these

two species are the same, the description of the one being drawn from fresh or young plants and the description of the other from old and dry plants.

If the arbitrary distinction between *Phyllosticta* and *Macrophoma,* the difference in the length of spores, is to be maintained, this plant should be referred to the genus *Macrophoma.*

The following is a description of my specimens:

The discolored spots are from 1–5 millimeters in diameter, white or brownish-white, irregularly scattered over the leaves. The pycnidia are subepidermal, globose-lenticular, generally epiphyllous but sometimes hypophyllous, brown to black, with distinct, circular ostiole. The spores are cylindric, straight or a little curved, obtuse at the ends, guttulate, apparently septate in old specimens, 4.5–5.5 × 20–30 μ.

Streptothrix pereffusa sp. nov.

Effused, dense, confluent, olive-green to black; mycelium septate, colored, branching; sporophores erect, septate, diffusely branched, branches flexuous; spores borne at the ends and the sides of the branches, colored, ovoid to ellipsoid, 5–8 μ.

On bark, Bemus Point, N. Y., July, 1913.

This species is closely related to *S. atra* B. & C. It may be separated from the latter by the color, the smooth sporophores, and the dense growth.

The following species have been reported from America: *S. abietina* Pk., *S. glauca* E. & E., *S. cinerea* Morg., *S. fusca* Corda, *S. atra* B. & C.

It is unfortunate that the name *Streptothrix* is used for a genus in the Chlamydobacteriaceae. Cohn established this genus in 1854, but Corda had already used the name for a genus in the Dematiaceae in 1839.

Oidium album sp. nov.[1]

Effused, forming a thin floccose layer over the substratum, white changing to dirty-white in drying; mycelium branched, septate; sporophores erect or suberect, simple or branched; spores concatenate, hyaline, ovoid to ellipsoid, 12–14 × 16–22 μ.

On bark and *Coriolus abietinus,* Bemus Point, N. Y., July, 1913.

[1] See MYCOLOGIA 5: 47. 1913.

The type specimens are deposited in the Carnegie Museum, Pittsburgh, Pa.

Polyscytalum flavum sp. nov.[2]

Effused, floccose, white at first, then yellow to sulphur-yellow; mycelium scanty; sporophores scarcely differing from the mycelium; spores in chains, chains branched or simple, cylindric, truncate at the ends, $3 \times 16\,\mu$.

On decayed wood, Bemus Point, N. Y., July, 1913.

This species resembles *Cylindrium flavo-virens* Bon., but the spores are larger and not curved.

The type specimens are in the Carnegie Museum, Pittsburgh, Pa.

Vaginata umbonata sp. nov.

Pileus thin, convex or expanded, 3.5–5 cm. broad, distinctly conically umbonate, covered with triangular scales arranged in somewhat concentric zones, tan-colored, scales darker, margin thin, smooth; gills 3–5 mm. broad, ventricose, sinuate, adnexed; stem 9–12 cm. long, solid, equal, concolorous, with long bulbous root; volva fimbriate, adhering closely to the stem; spores ovoid to ellipsoid, 5–7 μ (*pl. 117. f. 1*).

Growing in sandy soil at Ohiopyle, Pennsylvania, August, 1908.

This species is closely related to *Amanitopsis adnata* (Smith) Sacc. in its adnate gills; to *Agaricus* (*Amanitopsis*) *urceolatus* Viv. in its umbonate pileus; and to *Amanitopsis volvata* (Peck) Sacc. in its floccose-scaly pileus. It is easily separated from these species by its conic umbo, concentrically arranged scales, and fimbriate volva.

The type specimens are in the Carnegie Museum, Pittsburgh, Pa.

Marasmius Morganianus sp. nov.

Pileus membranaceus, convex, sometimes nearly expanded, glabrous, slightly rugulose on the margin, reddish-brown or rufescent, center darker, 2–5 mm. broad; gills few, subdistant, broad, adnate, pallid at first, darker when old; stem 2–3 cm. long, slender, equal, rufescent at the base, pallid at the top, covered with a white pubescence; spores fusoid or ellipsoid, 3–6 μ.

On fallen leaves, Somerset, Pennsylvania, August, 1906.

[2] See MYCOLOGIA **5**: 55. 1913.

In correspondence with Prof. A. P. Morgan in 1906 relative to some species of *Marasmius*, Mr. Morgan said concerning this plant, "I think it is something new, near *M. atro-rubens* Berk." The description was then written and submitted to Mr. Morgan for publication in the *Journal of Mycology*. For various reasons, it was not published at that time but the plant may be found by other collectors, and the description is therefore published.

The type specimens are in the Carnegie Museum, Pittsburgh, Pa.

PEABODY HIGH SCHOOL,
PITTSBURGH, PA.

EXPLANATION OF PLATE CXV

Figs. 1–3. *Hormisciopsis gelatinosa* Sumstine. Figs. 1–2 show mycelium, sporophores and spores highly magnified. Fig. 3 shows a group of plants nearly natural size.

Figs. 4–5. *Arthrosporium album* Sumstine. Fig. 4 shows stroma and spores highly magnified. Fig. 5, a group of plants nearly natural size.

Figs. 6–8. *Phyllosticta Atriplicis* Desm. Figs. 6 and 7 show leaves of *Atriplex hastata* with discolored spots containing pycnidia. Fig. 8 shows pycnidia and spores highly magnified.

EXPLANATION OF PLATE CXVI

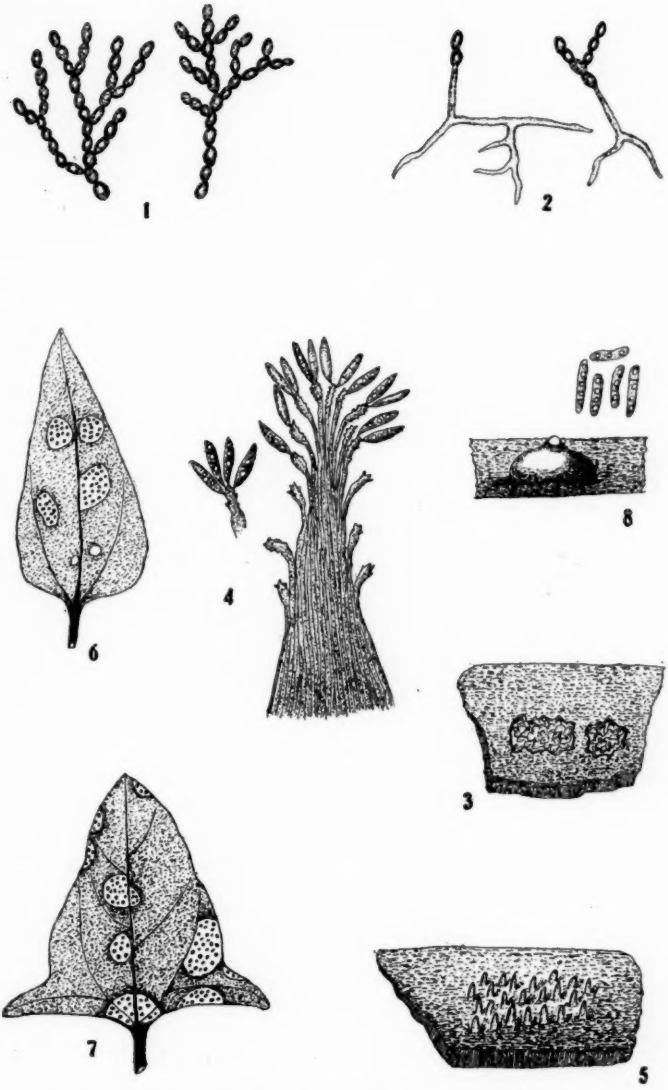
Fig. 1. *Oidium album* Sumstine; mycelium, sporophores and spores.

Fig. 2. *Polyscytalum flavum* Sumstine.

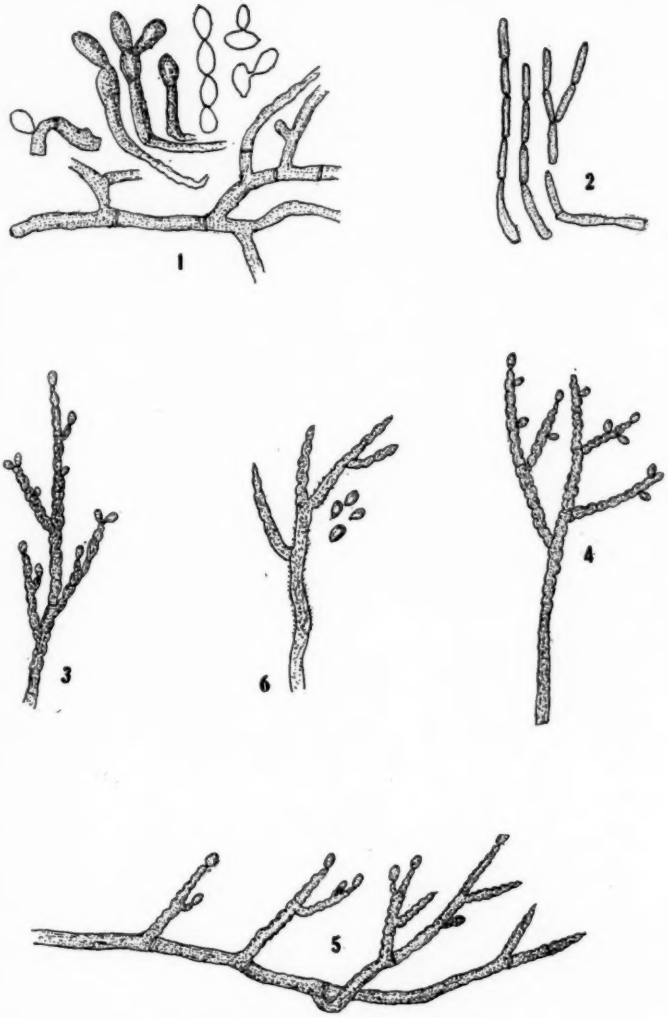
Figs. 3–5. *Streptothrix pereffusa* Sumstine; sporophores and spores.

Fig. 6. *Streptothrix atra* B. & C.

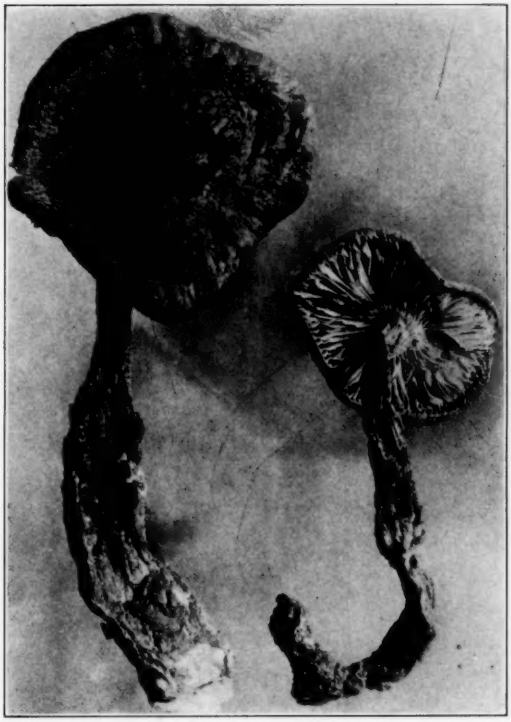
The figures were drawn with the aid of the camera lucida and are highly magnified.



HORMISCIOPSIS, ARTHROSPORIUM AND PHYLLOSTICTA



OIDIUM, POLYSCYTALUM AND STREPTOTHRIX



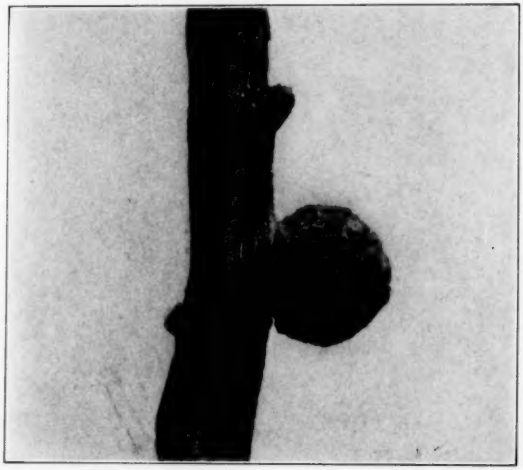


FIG. 1 (UPPER). VAGINATA UMBONATA SUMSTINE
FIG. 2 (LOWER). AERIAL GALL OF THE MESQUITE

AERIAL GALLS OF THE MESQUITE

F. D. Heald

[With Figure 2 on Plate 117]

During work upon a plant disease survey in the vicinity of San Antonio, Texas,[1] my attention was called to the frequent occurrence of galls upon the twigs and branches of the mesquite (*Prosopis glandulosa* Torr.). The following quotation is from the publication dealing with the survey mentioned: "The large limbs and smaller branches of the mesquite sometimes show abnormal enlargements which are frequently globular or sometimes elongated and sometimes greatly exceed the diameter of the branch on which they are produced. (Plate XV, figs. 2 and 3.) Specimens have been obtained ranging from 1 to 8 or 10 inches in diameter. The gall is produced by an abnormal growth of the wood, and cross sections of galls always show small brown specks where the wood cells are more or less disintegrated. These are distributed throughout the entire woody region.

"These galls are not of insect origin, and cultural work attempted has as yet failed to connect either bacteria or fungi with the disease, although both have been obtained."

The crown-gall organism, *Bacterium tumefaciens* Erw. Sm. & Townsend was strongly suspected of being the cause of the galls, but at the time of writing the bulletin referred to the authors had obtained no direct evidence of such causal relation. No opportunity was afforded for detailed work on this subject, but Dr. Erwin F. Smith, of the Bureau of Plant Industry, very kindly furnished some cultures of *B. tumefaciens* which were used with the class in plant pathology in making some inoculations on the mesquite.

The inoculations were all made on a large tree growing under natural conditions on the campus of the University of Texas. A

[1] Heald, F. D. and Wolf, F. A. A plant disease survey in the vicinity of San Antonio, Texas. Bull Bur. of Pl. Ind. U. S. Dept. Agr. **226**: 72. 1912.

small cutting needle was used to make a slit extending through the cortex and reaching the cambium, and the inoculum was introduced into each incision with a sterile needle. No protection of any kind was given by wrappings. An equal number of control incisions were made at the time. The inoculations were made on April 13, 1911, and a dry period followed. Conditions were so unfavorable for growth during the following months of spring and summer that successful inoculations were not anticipated. The results are given in the following table:

INOCULATIONS OF MESQUITE WITH B. TUMEFACIENS

Made 4–13–1911; record completed 9–21–1911

Strain of *B. tumefaciens* used	Age of shoots inoculated	Diameter of shoots	No. of inoculations	Result		No. of controls	Result
				No. of galls	Size of galls		
Hop.....	3 yrs.	8–10 mm.	10	1	8 mm.	10	All healed
Daisy....	3 yrs.	8–10 mm.	10	0		10	All healed
Daisy....	2 yrs.	6 mm.	10	2	13 and 10 mm.	10	All healed
Daisy....	1 yr.	4 mm.	10	1	15 mm.	10	All healed

Of the forty inoculations, four or ten per cent. proved successful, producing galls ranging in size from 8–15 mm. in diameter after five months and eight days, after which the record was discontinued. Two of the galls produced were nearly globular and showed a small surface of attachment (*pl. 116, f. 2*), one was somewhat flattened and elongated parallel with the axis of the shoot, and the fourth was globular-depressed. In no case did the control punctures show any abnormal growth, and all were perfectly healed when the record was completed.

The above record is not presented as conclusive evidence that the galls common on the mesquite throughout the southwest are of bacterial origin, but it at least affords a basis for this presumption. The inoculations reported do show at least that *B. tumefaciens* can produce aerial galls on the mesquite.

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NEWS AND NOTES

Nearly two hundred colored drawings of local fleshly fungi have recently been mounted in the swinging frames of the public museum of the New York Botanical Garden.

Dr. C. E. Lewis has resigned his position as associate in plant pathology in the Maine Experiment Station to enter private business.

Professor F. L. Stevens has resigned his position in the University of Porto Rico to become Professor of Plant Pathology in the University of Illinois. His address after February 1 will be Urbana, Illinois.

Dr. C. H. Kauffman, Assistant Professor of Botany in the University of Michigan, has been granted a research scholarship for February, 1914, to aid him in the preparation of manuscript for NORTH AMERICAN FLORA on the genus *Cortinarius*.

Leo E. Melchers, recently a graduate student and assistant in the Department of Botany at the Ohio State University, Columbus, Ohio, has been appointed assistant plant pathologist at the Kansas Agricultural Experiment Station, Manhattan, Kansas.

Mr. C. G. Lloyd, of the Lloyd Library and Museum, Cincinnati, Ohio, spent part of October and November at the Garden examining the collection of polypores. Mr. Lloyd has recently been to Cuba and Florida collecting specimens of this group of fungi.

The Fungi Which Cause Plant Diseases is the title of a book by Professor F. L. Stevens which has just been issued by Macmillan. The object of the book is to acquaint the student with the more important fungi which cause diseases of plants. A review of the book, which contains 754 pages and many illustrations, will appear in some future number of MYCOLOGIA.

In a preliminary paper in *Phytopathology* for December, 1913, W. H. Long discusses *Polyporus dryophilus* and *P. dryadeus* and the rots caused by them. He says that the former is known in Europe under at least three different names, and that Robert Hartig confused it with *P. dryadeus,* which causes in this country a serious rot in the roots of various species of oak.

Mr. Fred D. Fromme, formerly a graduate student at Columbia University, and Mr. H. C. Travelbee, graduate of Purdue University, have become assistants in the botanical department of the Indiana Experiment Station, filling positions formerly occupied by Dr. F. D. Kern and Mr. J. B. Demaree, who have gone to Pennsylvania State College. Their chief work will be in connection with the rust problems under investigation by the department.

The report of the botanist of New York State for 1912 appeared November 28 as Museum Bulletin 167. It contains descriptions of thirty-six new species of fungi and four colored plates of edible and poisonous species. *Amanita ovoidea* Bull. is reported from New York, and is put in the edible list. It is so very similar to the white form of *Amanita phalloides* that no one should think for a moment of using it for food. *Mycena splendidipes* Peck is described from Richmond County and is said to be poisonous. It is a beautiful species, with bright-yellow stipe and yellowish-brown to pinkish-brown pileus.

CANTHARELLUS CLAVATUS FROM DULUTH

Since the appearance of my article on the identity of *Cantharellus brevipes* and *Cantharellus clavatus* in MYCOLOGIA, September, 1913, I have received a box of fine specimens from Dr. S. M. Stoker, Duluth, Minnesota, who says he has often collected the plant in the neighborhood of Duluth and referred it to *Cantharellus brevipes* Peck. Most of the specimens are cespitose with the margin of the pileus thin and spreading like those shown in Plate 94. Some of the plants are branching. They agree with the Neebish specimens, although in some of them the spores are a

little shorter, not over 8 μ in length. Dr. Stoker writes that some Poles who collected mushrooms for food knew the plants and called them "*pig's ears,*" which is the popular name for *Cantharellus clavatus* in parts of Europe. The species appears to be more frequent in the Lake Superior district than in the East, where the closely related *Cantharellus floccosus* is more frequently met with. I have never collected *Cantharellus floccosus* farther west than the Muskoka Lake region in Ontario. Specimens of that species have been sent to me recently, collected by S. E. Hutton in New Hampshire. The species has been described by Peck and Murrill and illustrated by Peck, Hard, and Nina Marshall. As noted by Peck, the two species, *Cantharellus floccosus* and *Cantharellus clavatus,* form a distinct group agreeing with each other in general characters, nature of the lamellae, and color of the spores. The two species differ in color and size of spores, and in the fact that *Cantharellus clavatus* is solid with the pileus truncate or but little depressed and nearly smooth, while *Cantharellus floccosus* has the pileus floccose-scaly and trumpet-shaped or infundibuliform and hollow to the base, with thin flesh. The stem in both species is normally short, but in *Cantharellus floccosus* it is sometimes lengthened and curved, extending deep into the mould. In all the collections I have seen, these distinctions have been marked. So far as I am aware, *Cantharellus floccosus* has not been identified with any European form

EDWARD T. HARPER.

A BOOK ON TROPICAL PLANT DISEASES[1]

While works on plant pathology are becoming quite numerous, the present book is a pioneer in a new field, as no other work in English attempts to cover in adequate fashion the diseases of tropical plants for the entire world. Indeed, the literature of the subject is so scattered that few libraries can offer adequate facilities for the study of tropical plant diseases without such a guide

[1] The Diseases of Tropical Plants. By Melville Thurston Cook, Ph.D., Pp. xi, 317. Frontispiece and 85 text figs. London, Macmillan and Company, Ltd. 1913. Price 8/6.

as the present work offers. For such an undertaking, the author's experience in Cuba is a most valuable asset, as it has brought him into first-hand contact with many of the troublesome diseases of the tropics. The book is well written and copiously illustrated, a very large percentage of the cuts being original. In this respect it is more fortunate than some other plant pathologies which have appeared in recent years with the majority of cuts borrowed. The practice of borrowing extensively detracts from the value of any work, as it gives the reader a feeling that he is dealing with a second-hand subject, whereas original illustrations appeal to him as accompanying live matter treated by one who is acquainted with the subject at first hand.

The preface states that the "work is intended primarily for the planter; but it is hoped that it may be of some service to the student." This will account for the method of treatment adopted in the work. The chapters are arranged in three groups, those dealing in a general way with the nature and causes of plant diseases, those treating of the diseases themselves, and those which discuss the prevention and cure of these diseases. In the first group of chapters, the physiology and structure of plants are briefly outlined and the nature and symptoms of disease discussed. This is followed by a comprehensive survey of the classification of fungi with especial reference to the disease-producing forms. Bacteria, slime moulds, and other causes of plant diseases are also taken up in this connection.

In the second group of chapters, which constitutes the body of the work, the various diseases are discussed in detail both as to their symptoms and cause, as well as methods for their treatment. Here the diseases are grouped according to their host plants, which is a great convenience to the planter for ready reference, while the student of the fungi themselves will find the taxonomic references in the preceding chapters. In this connection, it is quite interesting to note that on the crops grown in both temperate and tropical regions serious diseases in the one region may be entirely absent from the other, or if present of only secondary importance.

The chapters on the prevention and control of disease

emphasize sanitation and prevention rather that the attempt to cure, once the crop is attacked. Remedial measures are discussed in detail, both as to the preparation and the application of the treatment. These chapters should not prove the least valuable portion of the book from the planter's standpoint. The book closes with an extended bibliography which must prove of great value to the student of tropical diseases from whatever angle he may approach the subject.

This work occupies a field so different from that of most works on plant pathology that it should be welcomed by the practical man of affairs, while it must be of no small value to the plant pathologist and to the mycologist in the tropics, as well as to all students of tropical fungi.

GUY WEST WILSON.

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